

## \* NOTICES \*

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## CLAIMS

(37)(Claim(2))

(A) An organic polymer which has a hydroxyl group or a hydrolytic basis combined with a silicon atom, and has at least one carbon atom which can form a bridge by forming a siloxane bond,  
 (B) One or more carbon atoms combined with a carboxylic acid titanium, carboxylic acid potassium, carboxylic acid barium, carboxylic acid manganese, a hardenable constituent containing one or more sorts of carboxylic acid metal salt chosen from carboxylic acid nickel,

(Claim 2)

(C) The hardenable constituent according to claim 1 which becomes considering an amine compound as an essential ingredient as an ingredient.

(Claim 3)

(A) A number average molecular weight is within the limits of 500-50,000, and an organic polymer of an ingredient is a general formula to an end and/or a side chain of a main chain (1):

[Formula 1]



the inside of a formula, R<sup>1</sup> and R<sup>2</sup> — respectively — independent — the alkyl group of the carbon numbers 1-20, it is the Tori ORGANO alloy group shown by the aryl group of the carbon numbers 9-20, the aralkyl group of the carbon numbers 7-20, or (R<sup>3</sup>) SiO— (R<sup>4</sup> is the substitution or the unsubstituted hydrocarbon group of the carbon numbers 1-20 independently, respectively). X is a hydroxyl group or a hydrolytic basis independently, respectively, a is 0, 1, 2, or 3, b is 0, 1, or 2, and a and b are not simultaneously set to 0, m is an integer of 0, or 1-19.

The hardenable constituent according to claim 1 or 2 coming out and having one or more hydrolytic silyl groups per molecule expressed.

(Claim 4)

The hardenable constituent according to claim 3, wherein X is an alkoxy group.

(Claim 5)

(A) A hardenable constituent given in any 1 paragraph of Claims 1-4 whose organic polymers of an ingredient are a polyoxallylene series polymer and/or a saturated hydrocarbon system polymer.

(Claim 6)

The hardenable constituent according to claim 5 which is a polymer, wherein said saturated hydrocarbon system polymer has a repeating unit resulting from isobutylene 50% of the weight or more in a total amount.

(Claim 7)

(B) Carboxylic acid calcium of an ingredient, carboxylic acid vanadium, carboxylic acid titanium, A hardenable constituent given in any 1 paragraph of Claims 1-6 to which carboxylic acid potassium, carboxylic acid barium, carboxylic acid manganese, and carboxylic acid nickel use as the main ingredients carboxylic acid metal salt expressed with general formula (2), (3), and (6) — (10).

respectively,

Ca(OOCR)<sub>2</sub> (2)

V(OOCR)<sub>3</sub> (3)

Ti(OOCR)<sub>4</sub> (6)

K(OOCR)<sub>4</sub> (7)

Ba(OOCR)<sub>2</sub> (8)

Mn(OOCR)<sub>2</sub> (9)

nickel(OOCR)<sub>2</sub> (10)

(The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a carbon carbon double bond.)

(Claim 8)

(B) The hardenable constituent according to any one of claims 1 to 7 whose carboxylic acid metal salt of an ingredient is the carboxylic acid metal salt in which the melting point has an acid radical of carboxylic acid which is 65 °\* or less.

(Claim 9)

(B) The hardenable constituent according to any one of claims 1 to 7 which is the carboxylic acid metal salt, which has an acid radical of carboxylic acid whose carbon numbers in which carboxylic acid metal of an ingredient contains carbon of a carboxyl group are 2-17.

(Claim 10)

(B) A hardenable constituent given in any 1 paragraph of Claims 1-8 which are metal salt of a carboxylic acid group contained compound in which carboxylic acid metal salt of an ingredient is chosen from octyloic acid, 2-ethylhexanoic acid, neo decanoic acid, oleic acid, or naphthoic acid.

(Claim 11)

(A) A hardenable constituent given in any 1 paragraph of Claims 1-10 containing the (B) ingredient of quantity which serves as 0.005 - 5 weight section by metallic element conversion contained in the (B) ingredient to ingredient: 100 weight section.

(Claim 12)

(A) A hardenable constituent given in any 1 paragraph of Claims 2-10 containing the (B) ingredient of quantity which serves as 0.005 - 5 weight section by metallic element conversion contained in the (B) ingredient, the (C) ingredient 0.01 - 20 weight sections to ingredient: 100 weight section.

[Translation done.]

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

In this invention, it has the hydroxyl group or hydrolytic basis combined with the silicon atom, and a siloxane bond is formed. Therefore, it is related with the hardenability constituent containing the organic polymer which has a silicon content group (hereinafter a "reactive silicon group") which can construct a bridge.

[0002]

[Description of the Prior Art]

It is known that the organic polymer which contains at least one reactive silicon group in a molecule has the feature that the polymer which constructs a bridge by formation of the siloxane bond is obtained by the hydrolysis reaction of a reactive silicon group, etc., and a rubber-like hardened material is obtained with hygroscopic surface moisture etc. also in a room temperature.

[0003]

In the polymer which it has, these reactive silicon groups a polyoxymethylene system polymer and a polyisobutylene system polymer. It is indicated by JP.552-73988.A, JP.H5-125272.A, JP.H3-75527.A, JP.S63-6003.A, JP.S63-6041.A, JP.H1-38407.A, JP.H6-231758.A, etc.

Especially a polyoxymethylene series polymer and a polyisobutylene system polymer are already produced industrially, and are widely used for uses, such as a sealing material, adhesives, and a paint.

[0004]

When an organic polymer is a saturated hydrocarbon system polymer especially, since it excels in heat resistance, a water resisting property, weatherability, etc., if the hardened material obtained is used for a structural sealing material, the sealing material for multiple glass, etc., it is effective. The isobutylene system polymer which has a repeating unit which furthermore originates in isobutylene 80% of the weight or more in a total amount is preferred as a sealant aiming at moisture proof from especially the thing to excel in low moisture permeability and low gas permeability.

[0005]

Such a sealing material generally fills up the joined part and cures between various members, the factory nature to the part ranging from being used to a long period of time in order to give a sealant and an antifouling becomes very important, and revealing, sufficient elongation and intensity are required for.

[0006]

Amine compounds, such as lauryl amine, are used together as a co-catalyst in many cases for the purpose of a silanol condensation catalyst being used for bridge construction and accelerating a polymer which, on the other hand, has such a reactive silicon group, and also accelerating a condensation reaction. As such a silanol condensation catalyst, divalent tin, such as octylo acid (2-ethylhexanoic acid) tin. The tin series catalyst represented by trivalent tin, such as dibutyltin bisacrylate/acetonate, is used widely, and when the movement of the part which places especially a sealing material is large, since the hardened material which has stability is obtained, many divalent tin are used.

[0007]

However, when octylo acid tin which is divalent tin, for example, is used together with the amine compound of a co-catalyst and is used as a curing catalyst of the (A) ingredient, the intensity and elongation of a hardened material which are acquired may be insufficient, and an improvement of the further physical properties is desired.

[0008]

Although most is a dibutyltin type, the latter trivalent tin series catalyst being used now. While the hardened material obtained has emollience, i.e., having the character to follow to the long-term stress change from the outside and fast curability, it is broadly used from the ability to apply as a curing catalyst of a liquid molding nature constituent. However, since today only a small amount of octylo acid tin is contained in the composition, it is questionable, development of the silanol condensation catalyst of a non-tin series is desired.

[0009]

In JP.S35-7955.B, JP.S32-3742.B, JP.S35-9639.B, JP.S37-3271.B, etc. As a curing catalyst of an organopolysiloxane constituent, the carboxylic acid metal salt of various kinds of non-tin is indicated with carboxylate of tin. As an example in which the carboxylic acid metal salt of non-tin was used for the curing catalyst of the constituent which, on the other hand, contains the organic polymer which has a reactive silicon group. Although there were carboxylic acid lithium (JP.H5-39428.A, JP.H9-12880.A) and carboxylic acid cerium (JP.2000-313814.A), there was no example broadly examined in various carboxylic acid metal salt until now.

[0010]

Problem(s) to be Solved by the Invention]

The purpose of this invention is as follows.

Have practical hardenability and stability with a good hardened material obtained.

Provide a hardenability constituent useful as the structural sealing material asked especially for high durability, the sealing material for multiple glass, the moisture seal material used for an electronic electronic component, adhesives, etc. from revealing the outstanding intensity and elongation.

[0011]

[Means for Solving the Problem]

In order that this invention persons may solve such a problem, as a result of inquiring, as a curing catalyst of the (A) ingredient Carboxylic acid calcium, Carboxylic acid vanadium, carboxylic acid iron, carboxylic acid titanium, carboxylic acid potassium, By using one or more sorts of carboxylic acid metal salt chosen from carboxylic acid barium, carboxylic acid manganese, carboxylic acid nickel, carboxylic acid cobalt, and a carboxylic acid zirconium. Securing moderate hardenability and stability, it finds out revealing high intensity and the physical properties of high elongation compared with a case where octylo acid tin is used as a curing catalyst, and came to complete this invention.

[0012]

Namely, this invention has a hydroxyl group of a hydrolytic basis combined with the (A) silicon atom. An organic polymer which has at least one silicon content group which can construct a bridge by forming a siloxane bond, (B) it is related with a hardenability constituent containing one or more sorts of carboxylic acid metal salt chosen from carboxylic acid calcium, carboxylic acid vanadium, carboxylic acid titanium, carboxylic acid potassium, carboxylic acid barium, carboxylic acid manganese, and carboxylic acid nickel.

[0013]

An amine compound is related with the aforementioned hardenability constituent which becomes as an essential ingredient as a (C) ingredient.

[0014]

As a desirable embodiment, a number average molecular weight is within the limits of 500-90,000, and as a silicon polymer of the (A) ingredient is a general formula to an end and/or a side chain of a main chain (1):

[0015]

[Formula 2]







silicon group used for this invention, (1). [Whether an olefinic compound of the carbon numbers 1-6, such as ethylene, propylene, 1-butene, and isobutylene, is polymerized as the main ingredients, and] (2) After making dense silica, such as butadiene and isoprene, homopolymerize or carrying out copolymerization to the above-mentioned olefinic compound, can obtain by a method of hydrogelation, but. Since an isobutylene system polymer and a hydrogelation polybutadiene system polymer tend to introduce a functional group into an end, and tend to control a molecular weight and can increase the number of end functional groups, they are preferred.

[0061] All the monomeric units may be formed from an isobutylene unit, and an isobutylene system polymer, and be 1 to 1 in an isobutylene system polymer 2 units, and the monomeric units of the isobutylene system polymer may be 10 or more of the weight % of the weight % of the isobutylene system polymer, when content of a monomeric unit which has isobutylene and copolymeric exceeds 50 % of the weight. Since characteristic physical properties, such as high weatherability, high heat resistance, low moisture permeability, etc. resulting from an isobutylene skeleton, are not fully revealed, it is not desirable.

[0062] As such a monomer component, an olefin of the carbon numbers 4-12, vinyl ether, an aromatic vinyl compound, vinylsilane, and arylsilane are raised, for example. As such a copolymer component, for example 1-butene, 2-butene, a 2-methyl-1-butene, a 3-methyl-1-butene, a pentene, 4-methyl-1-pentene, A hexene, a vinylcyclohexene, the methyl vinyl ether, ethyl vinyl ether, isobutyl vinyl ether, styrene, alpha-methylstyrene, dimethylstyrene, Monochlorostyrene, dichlorostyrene, beta-phenylene, indene, Vinyl trichlorosilane, Vinyl trimethylchlorosilane, vinyldimethylchlorosilane, vinyldimethylmethoxysilane, Vinyl trimethylsilane, divinyl dichlorosilane, divinyl methoxysilane, Divinyl dimethylsilane, the 1,3-divinyl-1, 1 and 3, 3-bis(trimethyl) disiloxane, TORBEI methyl methacrylate, tetra vinyl silane, allylchlorosilane, Allyl methylchlorosilane, allyl dimethylchlorosilane, allyl dimethylmethoxysilane, allyl trimethylsilane, diallyl dichlorosilane, diallyl dimethoxysilane, diallyl dimethylmethoxysilane, gamma-methacryloxy propyl trimethoxysilane, gamma-methacryloxy propyl methoxydimethoxysilane etc. are raised.

[0063] As monomeric unit which has isobutylene and copolymeric among the above, if vinylsilane and arylsilane and a basic silicon content increases and can act as a silane coupling agent will improve, and the adhesive property of a constituent obtained will improve.

[0064] Other monomeric units may be made to contain besides a monomeric unit used as the main ingredients like a case of the above-mentioned isobutylene system polymer in a hydrogelation polybutadiene system polymer or other saturated hydrocarbon system polymer.

[0065] To a saturated hydrocarbon system polymer which has a reactive silicon group used for this invention, A little monomeric units in which an after-polymerization double bond like polyene compounds, such as butadiene and isoprene, remains in the range in which the purpose of this invention is attained may be made to contain in 1 or less % of the weight of the range preferably especially 5 or less % of the weight still more preferably 10 or less % of the weight.

[0066] A saturated hydrocarbon system polymer which has these reactive silicon groups can be independent, or can be used together two or more sorts.

[0067] A process of a saturated hydrocarbon system polymer which has a reactive silicon group next is explained.

[0068] An isobutylene system polymer which has a reactive silicon group in molecular chain terminals among the isobutylene system polymer which has a reactive silicon group, an end organic-functions type obtained by the polymerization method (and a chain transfer agent) called inhibitor method — it can combining and [ which is called inhibitor ] and a chain transfer agent) called inhibitor method — it can manufacture preferably using a whole end organic-functions type isobutylene system polymer. As a

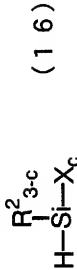
process of a saturated hydrocarbon system polymer which has a reactive silicon group. For example, general formula (15) after obtaining polybutadiene which has an unsaturation group at the end by dehydrohalogenation reaction of an end of a polymer which has third class carbon-chlorine combination obtained by a polymerization reaction, the reaction of an end of a polymer and allyl trimethylsilane which have third class carbon-chlorine combination, etc. :

[0069] [Formula 7]



(R<sup>1</sup>, R<sup>2</sup>, X, m, a, and b are the same as the above among a formula.) — the hydrosilane compound (this compound is a compound which the hydrogen atom combined with the basis expressed with a general formula (1)) expressed — desirable — general formula (16):

[0070] [Formula 8]



(R<sup>2</sup>, X, and c are the same as the above among a formula.) — it can obtain by the reaction (hydrosilylation reaction) to which the hydrosilane compound expressed is made to add using a platinum catalyst.

[0071] As a hydrosilane compound, for example Trichlorosilane, methyl dihydrochlorosilane, Halogenation Siling like dimethylchlorosilane and phenyl dichlorosilane, Trimethoxysilane, Triethoxysilane, methylmethoxysilane, methyl dimethoxysilane, the alkoxysilane like phenyl dimethoxysilane; Methyl diacetoxyallene, the silyloxy silanes like a phenyl diacetoxyallene; although the KETOSILH meta allene like bis(dimethyl) KETOSILH meta dimethylallene and bis(cyclohexyl) KETOSILH meta dimethylallene are raised, it is not limited to these. Among these, halogenation Siling and alkoxyallene are preferred especially in respect of the ease of acquisition, etc.

[0072] Such a manufacturing method is indicated in each example of JP.4-08650.B, JP.7-108923.B, JP.63-25394.A, JP.49-22594.A, and the patent No. 2539445, for example.

[0073] An isobutylene system polymer which has a reactive silicon group in a chain side chain is manufactured by adding and carrying out copolymerization of the vinylsilane and arylsilane which have a reactive silicon group into a monomer containing isobutylene.

[0074] In the case of a polymerization reaction which manufactures an isobutylene system polymer which has a reactive silicon group in molecular chain terminals. After carrying out copolymerization of the vinylsilane and arylsilane etc. which have a reactive silicon group in addition to an isobutylene monomer which is the main ingredients, an isobutylene system polymer which has a reactive silicon group in an end and a chain side chain is manufactured by introducing a reactive silicon group into an



carb group, a stearyl group, a behenyl group, etc. — usually — 10-30 — a long-chain alkyl group of 10-20 is raised preferably. Like a case of R<sup>1</sup>, an alkyl group of R<sup>2</sup> may be independent and may be mixed two or more sorts.

[0089] Although a chain of this vinyl system copolymer consists of a monomeric unit of a formula (18) and a formula (19) substantially, a "real target" here means that the sum total of a monomeric unit of a formula (18) which exists in this copolymer, and a formula (19) surpasses 50 % of the weight. The sum total of a monomeric unit of a formula (18) and a formula (19) is 70 % of the weight or more preferably.

[0090] From a point of compatibility with a polyoxallylene series polymer, as for an abundance ratio of a monomeric unit of a formula (18), and a monomeric unit of a formula (19), 95:5-40:60 are preferred at a weight ratio, and 90:10-60:40 are still more preferred.

[0091] As monomeric units other than a formula (18) which may be contained in this copolymer, and a formula (19). For example, carboxylic acid groups, such as acrylic acid and methacrylic acid, acrylamide, Amide groups, such as methacrylamide, trimethylamine, triethylamine, triisopropylamine, methylmethacrylamide, Epoxide groups, such as glycidyl methacrylate and glycidyl methacrylate, such as methacryloyl vinyl ether, a monomeric unit which originates in acrylonitrile, styrene, alpha-methylstyrene, alkyl vinyl ether, VCM/PVC, vinyl acetate, vinyl propionate, ethylene, etc. in addition to this is raised.

[0092] Although an organic polymer which blends a saturated hydrocarbon system system polymer which has a reactive silicon group, and a vinyl-base polymer which has a reactive silicon group is indicated by JP-H1-188784A, JP-2000-188176A, etc., it is not limited to in particular these.

[0093] A method of polymerizing an acryloyl ester (nxta) system monomer elsewhere under existence of an organic polymer which has a reactive silicon group as a manufacturing method of an organic polymer which blends a vinyl-base polymer which has a reactive silicon group can be used. Although this manufacturing method is concretely indicated by each gazette, such as JP-59-76223A, JP-59-168014A, JP-60-228516A, and JP-60-228517A, it is not limited to these.

[0094] Carboxylic acid calcium used as a (B) ingredient in a hardenability constituent of this invention. Carboxylic acid vanadium, carboxylic acid iron, carboxylic acid titanium, carboxylic acid potassium. One or more sorts of carboxylic acid metal salt. Chosen from carboxylic acid barium, carboxylic acid manganese, carboxylic acid nickel, carboxylic acid cobalt, and carboxylic acid zinc. These metal functions as what is called a latent crosslinking catalyst in a resin body and may be made to form from a hydroxy group combined with silicon contained in an organic polymer which is the (A) constituent of this invention, or a hydroxyloxy basis.

[0095] In said carboxylic acid metal salt, carboxylic acid calcium, carboxylic acid vanadium. Carboxylic acid iron, carboxylic acid titanium, carboxylic acid potassium, carboxylic acid barium, carboxylic acid manganese, and a carboxylic acid zinc. It is more desirable from a point that the activity of a catalyst is high, carboxylic acid calcium, carboxylic acid vanadium, carboxylic acid iron, carboxylic acid titanium, and a carboxylic acid zinc are still more preferred, and carboxylic acid iron and carboxylic acid titanium are especially the most preferred.

[0096] Carboxylic acid calcium, carboxylic acid vanadium, carboxylic acid titanium. Carboxylic acid potassium, carboxylic acid barium, carboxylic acid manganese, carboxylic acid nickel, carboxylic acid cobalt, and a carboxylic acid zinc. It is more desirable from a point with little coloring of a hardenability constituent obtained, and a point that the heat resistance of a hardened material and weatherability which are obtained are high, and carboxylic acid calcium, carboxylic acid titanium, carboxylic acid potassium, carboxylic acid barium, and a carboxylic acid zinc are still more preferred.

[0097] This (B) ingredient uses as the main ingredients carboxylic acid metal salt expressed with general formula (2) - (12), respectively.

Ca(OOCR)<sub>2</sub> (2)  
VO(OOCR)<sub>2</sub> (3)  
Fe(OOCR)<sub>2</sub> (4)  
Fe(OOCR)<sub>3</sub> (6)  
Ti(OOCR)<sub>4</sub> (6)  
K(OOCR) (7)  
Ba(OOCR)<sub>2</sub> (8)  
Mn(OOCR)<sub>2</sub> (9)  
nickel(OOCR)<sub>2</sub> (10)  
Co(OOCR)<sub>2</sub> (11)  
Zr (O) (OOCR)<sub>2</sub> (12)

(The letter R of the formula is substitution of an unsubstituted hydrocarbon group, and may include a carbon carbon double bond.)

As carboxylic acid, a carboxylic acid group content compound of a hydrocarbon system of 2-40 is used suitably, and a carbon number including carbonyl carbons may be especially used for a carboxylic acid group content compound of a hydrocarbon system of the carbon numbers 2-20 suitably from a point of availability here.

[0098] When it illustrates concretely, acetic acid, propionic acid, butanoic acid, a valeric acid, caproic acid, Enanthic acid, caprylic acid, 2-ethylhexanoic acid, palmitic acid, capric acid, Undecanoic acid, lauric acid, tridecanoic acid, myristic acid, pentadecanoic acid, Palmitic acid, heptadecanoic acid, stearic acid, nonadecanoic acid, arachidic acid, Behenic acid, lignonic acid, ceranic acid, montanic acid, melissic acid, Straight chain saturated fatty acid groups, such as PAKOGERU acid, Purocyano acid, Linoleic acid, Tazuoic acid, PIZETERN acid, myristoleic acid, 2-undecadecanoic acid, 2-undecadecanoic acid, 7-undecadecanoic acid, palmitoleic acid, 9-palmitoleic acid, Oleic acid, 11-oleic acid, ASUKIREPIN acid, 12-oleic acid, Gondoic acid, 13-oleic acid, a stearic acid, erucic acid, brassic acid, sebacic acid, Monosaturated fatty acid, such as KISHIMEN acid and RIMUKUEN acid. Linoleic acid, 10,12-octadecadienoic acid, HIRAGO acid, alpha-oleostearic acid, beta-oleostearic acid, punicic acid, linoleic acid, 8,11,14-tricosatrienoic acid, 7,10,13-tetradecatrienoic acid, 4,8,11,14-tetradecatrienoic acid, MOROKUCHI acid, sear-RIDON acid, Arachidonic acid, 8,12,16,19-tetradecatetraenoic acid, 4,8,12,15,18-pentacosapentaenoic acid, Polyene unsaturated fatty acid, such as clupanodonic acid, herring acid, and docosahexaenoic acid; Iso acid, Branch fatty acid, such as antiazo acid, tuberculostearic acid, a pivalic acid, and neo decanoic acid. A tartaric acid, Fatty acid with triple bonds, such as stear roller acid, a cerypinic acid, KISHIMEN acid, and 7-hexa-cis-9-chole acid.

Naphthenic acid, A malvalic acid, sterolic acid, HDONO carbonyl acid, chaulmoigric acid, Alkylcyclo carbene acids, such as gerlic acid, Sebacic acid, 2-hydroxytetradecanoic acid, IPURURU acid, 2-hydroxyhexadecanoic acid, YARAPI Norian acid, un-PERIN acid, AMBURETTORU acid, ARYURITTO acid, 2-hydroxyoctadecanoic acid, 12-hydroxyoctadecanoic acid, 18-hydroxyoctadecanoic acid, Oxygenated fatty acid, such as 9,10-dihydroxyoctadecanoic acid, retchelic acid, cam ROEN acid, Ilicanic acid, ferroc acid, and cerbaronic acid decarboxylic acid, such as succinic acid, glutaric acid, adipic acid, pimelic acid, SUPERIN acid, azelaic acid, and sebacic acid, is mentioned.

[0099] When the melting point of said carboxylic acid is high (crystallizability is high), the melting point becomes high in a resin minimum amount, and it is hard to mix with said fatty acid metal salt which has the acid high in a resin minimum amount. Thus, as for the melting point of said carboxylic acid, it is preferred that it is 65 °C or less, it is more preferred that it is -50-50 °C, and it is preferred that it is especially -40-35 °C.

[0100] When a carbon number of said carboxylic acid is large (a molecular weight is large), it becomes when the melting point of said carboxylic acid is high (crystallizability is high), the melting point becomes high in a resin minimum amount, and it is hard to mix with said fatty acid metal salt which has the acid high in a resin minimum amount. Thus, as for the melting point of said carboxylic acid, it is preferred that it is 65 °C or less, it is more preferred that it is -50-50 °C, and it is preferred that it is especially -40-35 °C.







As a hardening agent of an epoxy resin, a publicly known hardening agent for epoxy resin can be used widely conventionally. For example, triethylenetetramine, tetraethylenepentamine, diethylenetriamine, N-aminophenyl piperazine, m-xylylene diamine, m-phenylenediamine, Diaminodiphenylmethane, diaminodiphenyl sulfone, isophorondiamine, Amine, such as 2,4,6-tris(dimethylamino)phenyl phenol, Tertiary amine salts, polyamide resin, and aldimine. In addition, various hardening agents such as enamines, imide derivatives, and cycloimidates. Boron trifluoride complex compounds, phthalic anhydride, hexahydro phthalic anhydride, Alkylphosphor carboxylic acid, such as tetrahydro phthalic anhydride and methyltetrahydro phthalic anhydride, a DODESHENR succinic anhydride, pyromellitic dianhydride, and anhydrous KURUREN acid, azobisisobutyronitrile, and carboxylic acid can be mentioned.

[0125] An epoxy resin receives reactive-silicon-group containing organic-polymer 100 weight section. It is preferred to use it in the range of one to 100 weight section and also ten to 50 weight section, and it is preferred to blend a hardening agent of an epoxy resin per epoxy resin 100 weight section in the range of one to 200 weight section and also ten to 100 weight section.

[0126] An ingredient which limitation in particular does not have in the method of preparation of a hardenability constituent of this invention, for example, was described above is blended. It kneads under ordinary temperature or heating using a mixer, a roll, a kneader, etc. or an ingredient is dissolved using a little suitable solvents, and a usual method of mixing may be adopted. A 1 liquid type, two-component type, or many liquid type compound can also be built and used by combining these ingredients suitably.

[0127] If a hardenability constituent of this invention is exposed into the atmosphere, by operation of moisture, it will form network structure in three dimensions, and will harden it to a solid which has rubber-like elasticity.

[0128] In a hardenability constituent of this invention, various additive agents can be added if needed. Other during catalysts as an example of solid active for example, lead compounds, cobalt compounds, tin compounds, etc.). Adhesive grant agents which improve the adhesive characteristics of a hardened material to glass, metal, ceramic, wood, plastic, rubber, and a flame coupling agent. An antioxidant, radical inhibitors, ultraviolet light absorber, a metal deoxidizer, anti-ozonant, light stabilizer, the Lynn system peroxide decomposition agent, lubricant, paints, a foaming agent, a photo-setting resin, a rheotropic grant agent, etc. are raised.

[0129] An example of such an additive is indicated in each gazette of JP-4-490555-B, JP-7-106928-B, JP-63-254149-A, and JP-64-22304-A, for example.

[0130] Since a hardenability constituent of this invention has outstanding weatherability, heat resistance, water resisting property, and electric insulation resulting from a principal chain skeleton and it has high intensity and a physical-properties improvement effect of high elongation. It can use conveniently for electrical insulation materials, such as electric electronic component materials, such as a structural elastic sealing compound, a sealing material for multiple glass, a solar cell rear-face sealing agent, pre-insulation an electric wire material for cables, a binder, adhesives, a paint infusion, a coating material, a sealing agent for rust prevention / water proof, etc. It is especially useful when used for adhesives, a structural elastic sealing compound, or a sealing material for solder.

[0131] [Example] Although working example and a comparative example explain this invention concretely below, this invention is not limited to this.

(A) As a working example, a polyethylene system polymer (Kaseko Corp. make, trade name EP055SSisobutylene system polymer / aarufin series process all is 100/50 150 weight section which has a reactive silicon group as an ingredient). Epoxy resin (product [made from Oil recovery Shell Epoxy], trade name Epicoat 828) 5 weight section, Hydrogenation alpha-olefin oligomer (product [made from

Idemitsu Petrochemistry], trade name PAC900A) 60 weight section, Colloid calcium carbonate (Maruo Calcium Co., Ltd. make, trade name SHRETTUSU 50 50 weight section, Colloid calcium carbonate (Maruo Calcium Co., Ltd. make, trade name MC-50 50 weight section, Heavy-calcium carbonate (product [made from Shirohata Calcium], trade name SOUTON 3200 40 weight section, Photo-setting resin (Toagosei make, trade name AKONIKUSU M-300) 3 weight section, Benzotriazole system ultraviolet ray absorbent (Sasagawa Chemicals Co., Ltd. make, trade name SANORU LS-770) 1 weight section, Hindered phenolic antioxidant (Chiba-Ogata Chemicals Co., Ltd. make, trade name IRUGA NOX 1010) 1 weight section, and water 5 weight section were measured respectively, and it often kneaded with a 3 point roll, and was considered as base resin.

[0132] next — as the (B) ingredient: — octyloic acid (2-ethylhexanoic acid) calcium salt (the Nihon Kagaku Sangyo Co., Ltd. make), The trade name NIKKANAFU Chicks Ca 5% toluene solution and used as a hardening agent Lin / for the thing for which distearyl amine (the Kasei Corp. make, Firm D18) is respectively shown in Table 1 as a (C) ingredient and which could number / of weight sections / — measure, could use the spatula, and was stirred and mixed / working example 1 ]

[0133] here — as the (B) ingredient of this invention — naphthenic acid vanadium (the Nihon Kagaku Sangyo Co., Ltd. make), as a trade name NIKKANAFU textile V 2% toluene solution and the (C) ingredient — distearyl amine (the Kasei Corp. make). The number of weight sections ]-used thing which shows Firm D18 in Table 1 respectively is made into working example 2. (B) as an ingredient — octyloic acid (2-ethylhexanoic acid) iron (the Nihon Kagaku Sangyo Co., Ltd. make). The number of weight sections ]-used thing which shows respectively lauryl amine (made by Wako Pure Chemical Industries, Ltd.) in Table 1 as a trade name NIKKANAFU Chicks Fe 5% toluene solid and which ingredient is made into working example 3. The number of weight sections ]-used thing which shows respectively octyloic acid (2-ethylhexanoic acid) titanium (3% toluene solution) and a (C) ingredient — distearyl amine (the Kasei Corp. make) by Wako Pure Chemical Industries, Ltd.) in Table 1 as a trade name NIKKANAFU Chicks Ti 3% toluene solution and a (C) ingredient — octyloic acid (2-ethylhexanoic acid) iron (the Nihon Kagaku Sangyo Co., Ltd. make) by Wako Pure Chemical Industries, Ltd.) in Table 1 as a trade name neo SUTAN U-20 and a (C) ingredient was made into the comparative example 1.

[0134] These base resin and hardening agents were mixed by the ratio shown in Table 1, respectively, and what constructed the aluminum base material to H type in accordance with the manufacturing method of the tensile adhesive property specimen to which this is specified JISA5758-1992 was filled up. Care-of-health conditions were made into 23 ±x47 ±50 sec seven days. [ per day ] The used aluminum uses the alumina treatment aluminum of the 9050505-mm size based on JIS H4000 as a substrate. After purifying by methyl ethyl ketone (made by Wako Pure Chemical Industries, Ltd.) before being filled up with the compound, the primer (the Tokyo Industries Dow Corning make, trade name D-2) was dried and used under ordinary temperature for spreading and 30 minutes.

[0135] In accordance with the tensile cement test method of 5758 — 1992 N of JIS A, the examination was presented with H type sample obtained by the above-mentioned method in condition of speed of: testing 30 mm/min under 23 ±° and the climatostat chamber of 50±5% of humidity.

[0136] The recovery was measured by the following methods. First, after making H type sample which ended the above-mentioned care of health immersed into 50 ±° warm water for one day and taking it out, it was subjected under the room temperature on the 1st. Subsequently, after having compressed and fixed to 70% so that sample thickness might be set to 12 to 8.4 mm, and heating a sample in 100 ±° hot air drying equipment for one day, it released from compression and was neglected under the room temperature on the 1st. The thickness of the sample in this case was measured and the recovery to a compressed part was computed.

[0137] Time (tearover-covered time) until it fills the same compound in an obtinant can simultaneously as a measure which estimates hardenability and stretches a hide on the surface under 23 ±° and the



plate. On each substrate which purified the surface by methyl ethyl ketone, 1 liquid mold-curing nature constituent was placed from 1 liquid cartridge using commercial cancer to the crest shape with a 1 cm [in width] × length of about 3 cm, and it was recuperated for 23 ± 14-150 days per day. The manual friction test was done after care of health, cutting an adhesion side deeply with a cutter knife, and the surface of the substrate was observed. The filled hardened material is that cohesive failure is shown, and CF in Table 2 is a fracture state searched for as a sealing material.

[0142]

Depths hardenability took out the portion which has hardened the surface which filled in the 80-mm-long polyethylene tube 1 liquid mold-curing nature constituent produced in working example 5, and was made at the tip of a tube in it at 16.5 mm in inside diameter on the day which the days to measure visited, and measured the hardened thickness with slide calipers.

[0143]

In order to check the practicality as a 1 liquid mold-curing nature constituent, where 1 liquid cartridge filled up with a constituent, it was used for two weeks in the hot air drying equipment which circulates the temperature control to 50 ± 4, and the depths hardenability after storage was investigated.

[0144]

A result is shown in Table 2.

[0145]

[Table 2]

配合表	成分		実施例6		比較例2	
	(A)成分	製品名	95	95		
	可塑剤	PPG3000	55	55		重量部
	炭酸カルシウム	白炭素CCR	120	120		重量部
	光安定剤	サノールLS-770	1	1		重量部
	紫外線吸収剤	チズピン327	1	1		重量部
	タレ防止剤	デイスパロン#6500	2	2		重量部
	酸化チタン	タイベークR-820	20	20		重量部
	脱水剤	A-171	2	2		重量部
	接着性付与剤	A-1120	3	3		重量部
	(B)成分	オクテリル銀ジメチルニウム U-220	6.1			重量部
	(C)成分	ラウリルアルミン	1.4	2		重量部
H型引張機械特性		M50	0.27	0.19		MPa
		M100	0.38	0.31		MPa
		M150	0.46	0.40		MPa
		TB(断面強度)	0.84	0.93		MPa
接着性		EB(経断伸び)	520	570		%
		陽極酸化アルミニウム 塩化銅板	CF	CF		破壊状態 破壊状態
硬化性	深部硬化性	23℃×1週間	7.7	10.6		mm
		23℃×2週間	12.2	15.6		mm
貯蔵安定性 (50℃×2週間貯蔵)	深部硬化性	23℃×1週間	7.2	10.6		mm
		23℃×2週間	12.0	16.4		mm

As opposed to the polyether system polymer which serves as the (A) ingredient of this invention in working example 5, (B) By using the lauryl amine which acts the carboxylic acid zirconium salt which acts as a co-catalyst as a (C) ingredient further as a silanol condensation catalyst as an ingredient, Although hardenability was slightly inferior as compared with the comparative example 2, the hardenability of the present invention was comparable to that of the comparative example 2. Although the diethyl dimethyl acetate was used as a solvent, the present invention was comparable elongation and an adhesion property were confirmed. It was checked that 1 liquid mold-curing nature constituent which has sufficient practical use was obtained (Table 2). (Synthetic example 1)

Use polypropylene prior of the molecular weight 3,000 [about 1] as an initiator, and propylene oxide is polymerized in a zinc hexa cyanocobaltate glyme complex compound catalyst. Number average molecular weight about 25,000 (polystyrene reduced molecular weight in which the column measured the solvent using THF using the TOSOH TSK-GEL H type using TOSOH HLC-8120GPC as a liquid-

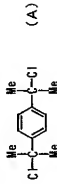
sanding system) polypropylene oxide was added. Then, the methanol solution of NaOMe of the equivalent was added 1.2 times to the hydroxyl group of polypropylene oxide and polypropylene oxide, and methanol was distilled off, and also the silyl chloride was added, and the hydroxyl group of the end was changed into the silyl group. By the above, the end obtained 3 organic-functions polypropylene oxide of the number average molecular weight 20,000 [about] which is an allyl group. [0146]

The nitrogen purge was carried out, after having added 500 g of allyl and 3 organic-functions polypropylene oxide and 10 g of hexane which were obtained above, 1 L of toluene, dehydrating azeotropically at 80 and distilling off hexane. On the other hand, after adding 50 mmol of allyl chloride to the allyl group (it is 3% of the weight of xylene solution by platinum 50 mmol) and 1.70 g of dimethoxymethylsilane was dropped. After making the mixed solution react at 90 °C for 2 hours, a treated dimethoxymethylsilane was distilled off under decomposition and the reactive silicon group content polyoxyalkylene series polymer (A-1) was obtained. The number average molecular weight of the obtained polymer (A-1) was about 26,000. The silyl group introduction rate was measured by the following methods by <sup>1</sup>H-NMR (it measures in a CDCl<sub>3</sub> solvent using JEOL JNM-LX400). Relative-value1 of the peak integral value of the allyl and proton (near CH<sub>3</sub>=OCH-CH<sub>2</sub>-3.1 ppm) to the peak integral value of the CH<sub>3</sub> group (near 1.2 ppm) of the polypropylene oxide main chain of said allyl and 3 organic-functions polypropylene oxide before a hydroxylation reaction. Relative the peak integral value of the CH<sub>3</sub> group (near 1.2 ppm) of polypropylene oxide main chain of the allyl and polypropylene oxide (A-1) after a hydroxylation reaction. The relative value of the peak integral value of the proton (near CH<sub>3</sub>OCH-CH<sub>2</sub>-3.1 ppm) of the methylene group combined with the silicon atom of the end allyl group: Two \*\*, it is, a silyl group introduction rate (%=2). It was 78%.

(Synthetic example 2)

After attaching a three-way cock to the resisting pressure glass container of 2L and carrying out the nitrogen purge of the inside of a container to it, using an injector, in a container 262.5 ml of ethylcyclohexane (thing dry by neglecting 1 or more night with the molecular sieves 3A), and 787.5 ml of toluene (thing dry by neglecting 1 or more night with the molecular sieves 3A), p-DCC (the following compound (A)) 4.85g (21.0mmol) was added.

[Formula 11]



Next, the resisting pressure glass equipped gas extraction pipe with a needle valve containing 438 ml (515 mmol) of isobutylene monomer was connected to the three-way cock, and after attaching the polymerization vessel all over dry ice / ethanol slush of -70 °C and cooling, the inside of a container made decompression using the vacuum pump. After opening the needle valve and introducing an isobutylene monomer in a polymerization vessel from a liquefied gas extraction pipe, the inside of a container was returned to ordinary pressure by introducing nitrogen from one side in a three-way cock. Next, 0.72 g (7.7mmol) of 2-methylpyridine was added. Next, 10.58 ml (96.5mmol) of titanium tetrachloride was added, and the polymerization was started. 70 minutes after the polymerization start, 7.20 g (63.0mmol) of allyl trimethylsilane was added, and the introduction reaction of the allyl group was performed to molecular chain terminals. After adding allyl trimethylsilane and 200 ml of water washed [ 120 minutes ] the reaction solution 4 times, the allyl and isobutylene system polymer was distilled off a solvent.

[0148]

Subsequently, the allyl and isobutylene system polymer 200g obtained in this way, the paraffin-base process oil (the Benitatsu Kosoan make), which is a hydrocarbon system plasticizer. After mixing trade

name Diana process PS-32 100g and carrying out temperature up to about 76 °C, the 7.5x10<sup>-5</sup> equivalent was added [ methyl dimethoxysilane ] for 2.4 Et and a platinum (vinyl siloxane) complex to the allyl group of an end and the hydroxylation reaction was performed. FT-IR (Shimadzu IR-403) performed reaction purport, and the absorption based on the olefin of 1640 cm<sup>-1</sup> disappeared about 20 hours.

[0149]

2/1 of PS-32 which is the isobutylene system polymer and plasticizer which have a reactive silicon group in the both ends of the target chain of the mixtures (A-2) of the weight ratio were obtained. In this way, if the obtained polymer is measured by the GPC method (it was considered as the liquid-sending system and, as for the solvent the column used CHCl<sub>3</sub> using Shodex K-804 using LHMModule made from Waters). The number average molecular weight was 17,600 and Mw/Mn (ratio of weight average molecular weight to a number average molecular weight) was 1.23. <sup>1</sup>H-NMR (using VarianGemini300) The proton which belongs to each structure by measurement in CDCl<sub>3</sub> (the proton of initiator origin: 6.5-7.5 ppm) The methyl proton combined with the silicon atom of polymer-terminal origin: As a result of measuring and measuring the intensity of 0.0-0.1 ppm and the resonance signal of methoxy proton:3.4 ~ 3.5, the end silyl functional group number Fn (number of the silyl group per one molecule of isobutylene polymer) was 1.76.

(Working example 8-15, comparative example 3)

(A) As an ingredient, various additive agents were measured, respectively, and it often kneaded with a paint roll according to the formula shown in Table 2, using the reactive silicon group content polyoxyalkylene series polymer (A-1) obtained in the synthetic example 1, and was considered as base resin.

[0151]

Next, as a (B) ingredient which is a silanol condensation catalyst, lauryl amine was further measured for the various carboxylic acid metal salt shown in Table 1, and kneaded with base resin as a (C) ingredient, the spatula was used for it, and the mixture was stirred for 3 minutes. It was made for all the numbers of metal salt of the (B) ingredient to become the same here. The mold about 3 mm thick was used and filled up with the spatula after mixing, and care of health on 23 °C x3 ~50 °C x the 4th was performed. [ per day ] From the obtained hardened material sheet, the No. 3 type dumbbell specimen (specified to JIS K 6301 was placed, and the tensile test was carried out in the autograph (tension speed 200 mm/min). The modulus (M50) in the time of being extended 50%, the intensity at the time of a dumbbell fracture (Tb), and the elongation at the time of a dumbbell fracture (Eb) were measured.

[0152]

The combination presentation of base resin, a curing catalyst, etc. and the physical-properties evaluation result of the hardened material obtained from it are shown in Table 3.

[0153]

[Table 3]

condensation catalyst was measured, and also as a (C) ingredient, lauryl amino was used together to the above-mentioned base resin, the spatula was used by working example 16-28 and the comparative example 4 for it, and it stirred and mixed for 3 minutes to it. It was recuperated at 23 °C after mixing, and the surface hardened state was evaluated five days afterward. It was made for all the numbers of mols of the metal atom containing the number of addition parts of the various hydroxide amino salt of the (B) ingredient to become the same here.

The evaluation result of the hardened state five days after the combination presentation of base resin, a curing catalyst, etc. is shown in Table 4. What the surface had hardened 0 in front for five days after measured in column, and it is shown that x had not hardened five days after

[illegible][illegible]

[Table 4]

[illegible]

(7) 経路探索カルグナム  
 (8) 経路探索カルグナム  
 (9) 経路探索カルグナム  
 (10) 経路探索カルグナム  
 (11) 経路探索カルグナム  
 (12) 経路探索カルグナム  
 (13) 経路探索カルグナム  
 (14) 経路探索カルグナム  
 (15) 経路探索カルグナム  
 (16) 経路探索カルグナム  
 (17) 経路探索カルグナム  
 (18) 経路探索カルグナム  
 (19) 経路探索カルグナム  
 (20) 経路探索カルグナム

When the various carboxylic acid metal salt of working example 6-15 is used compared with the comparative example 3 using 2-ethylhexanoic acid tin as a silanol condensation catalyst as shown in Table 3, the value of T<sub>0</sub> (breaking strength) and Eb (elongation after fracture) of hardened material physical properties is larger.

Working example 16–28. comparative example 4)

(A) Using the mixture (A-2) of the isobutylene system polymer and plasticizer which have as an ingredient the reactive silicon group obtained in the synthetic example 2, various additive agents were measured, respectively, and it often kneaded with a 3 point roll according to the formula shown in Table 4, and was considered as base resin.

[0154] About the various carboxylic acid metal salt shown in Table 4 as a (B) ingredient which is a silano-

[http://www.indeed.com/jobs?q=web+dev&from=jobresults&rank=1&start=10&end=20](#)

http://www4.indinipit.go.jp/cgi-bin/tranweb.cgi.eije?atw\_u=http%3A%2F%2Fwww4.ipdl.i... 2010/05/08

When the various carboxylic acid metal salt of working example 15-28 is used as shown in Table 4, in spite of having used the silanol condensation catalyst of the non-tin series, the surface has hardened in five days.

Practical hardenability was shown.

On the other hand, when the carboxylic acid zinc of the comparative example 4 was used, hardenability had not hardened five days after bad.

[0157]

As mentioned above, the organic polymer which has at least one reactive silicon group in the (A) molecule, (C) Carboxylic acid calcium, carboxylic acid sodium, carboxylic acid potassium, carboxylic acid lithium, carboxylic acid barium, carboxylic acid magnesium, carboxylic acid zinc, carboxylic acid cobalt, and other sorts of carboxylic acid metal salt chosen from a carboxylic acid zirconium, and a hardenability [\*\* and others] constituent. In spite of being a non-tin series catalyst, practical hardenability is shown, and it turns out that hardened material physical properties are also finess (high elongation and high intensity).

(Constituent using the trimethoxysilyl group as a reactive silicon group)

If a trimethoxysilyl group uses the polyoxyalkylene series polymer which exists in molecular chain terminals as a reactive silicon group, a cure rate will become large from the polymer of the synthetic example 1. The direction of a trimethoxysilyl group of this is because reactivity is larger than a methyl dimethoxy silyl group. Such a polymer is indicated to JP-H1-12480A or JP-2001-79855A. For example, the same hardenability constituent as working example 6-15 can be prepared using the polymer indicated for the example 1 of manufacture of JP-H1-12480A. The tack free time of the example 6-15 can be prepared using the polymer indicated for the example 1-4 of manufacture of JP-2001-79855A. The tack free time of this constituent is shorter than working example 6-15. Therefore, a catalyst amount can be lessened, if cure time is made into the same grade and the polymer which has the above-mentioned trimethoxysilyl group will be used.

[0158]

If the mixture of the polymer which has a trimethoxysilyl group, and the polymer which has a methyl dimethoxy silyl group is used as a polymer, a time saving effect and the physical properties of a hardened material are finely combined. For example, the hardenability constituent of working example 6-15 can be prepared as the polymer which mixed the polymer which has a trimethoxysilyl group, and the polymer which has a methyl dimethoxy silyl group by the weight ratio of 1:10-10:1.

[0159]

Working example when the polymer which has a trimethoxysilyl group is used is shown below.

(Synthetic example 3)

The inside of bottom of N<sub>2</sub> atmosphere 1L autoclave, According to a composite metal complex compound catalyst It polymerizes. The obtained polyoxyethylene oxide. Use and to the compound which molecular weight 17,000 and the polyoxyethylene diol 1000g of molecular weight-distribution Mw/Mn=1.20 as 13g of gamma-isocyanato propyltrimethoxysilane (Nippon Unicar make Y-5187) and a catalyst 0.05 g of dibutyl tin screw isocyanatocyclotriolite (made in [U-360] transformation [Japanese east]) is added, it reacted at 80 °C under the isocyanate group was no longer detected in IR under the nitrogen air current in this, and the reactive silicon group of polyoxypropylene (A-3) by which the trimethoxysilyl group was introduced into about 80% of ends was obtained. (Working example 29-32)

(A) The polyoxyalkylene series polymer (A-1) which has as an ingredient the methyl dimethoxy silyl group obtained in the synthetic example 1. The various carboxylic acid metal salt which is the (B) ingredients according to the formula shown in Table 5 using the polyoxyalkylene series polymer (A-3) which has the trimethoxysilyl group obtained in the synthetic example 3. (C) Lauryl amine which is an ingredient was measured, respectively, the spatula was used, and it stirred and mixed for 30 seconds. It was made for all the numbers of mole of the metal atom containing the number of addition parts of the various carboxylic acid metal salt of the (B) ingredient to become almost the same ratio. The surface was lightly pressed down with the spatula after mixing, and time (lather-covered time) until a constituent stops adhering at the tip of a spatula was measured.

組成 (重量部)		実施例			
(A) 成分	A-1	29	30	31	32
	A-3	100		100	100
(B) 成分	ニッパチケイ素酸鉄Ⅲ (T) <sup>(a)</sup>	6.6	6.6		
	ニッパチケイ素酸鉄Ⅲ 65% (T) <sup>(b)</sup>			5.6	5.6
(C) 成分	ラウリルアミン	0.66	0.66	0.66	0.66
	皮張り時間 (23℃)	41min	21min	300min以上	105min

(1): 2-エチルヘキサン酸鉄のミネラルスピリット溶液、金属(Fe)含有量: 6%

(2): 2-エチルヘキサン酸カルシウムのミネラルスピリット溶液、金属(Ca)含有量: 5%

As shown in Table 5, the polyoxyalkylene series polymer (A-3; working example 30 and 32) which has a trimethoxysilyl group had the cure rate quicker than the polyoxyalkylene series polymer (A-1):

[http://www4.ipd.lipit.go.jp/cgi-bin/bran\\_web.cgi?ajie?atw=htc34X2F2?www4.ipd.l.](http://www4.ipd.lipit.go.jp/cgi-bin/bran_web.cgi?ajie?atw=htc34X2F2?www4.ipd.l.) 2010/05/06

[http://www4.ipd.lipit.go.jp/cgi-bin/bran\\_web.cgi?ajie?atw=htc34X2F2?www4.ipd.l.](http://www4.ipd.lipit.go.jp/cgi-bin/bran_web.cgi?ajie?atw=htc34X2F2?www4.ipd.l.) 2010/05/06



working example 29 and 31) which has a methyl dimethoxy silyl group.

[0192]

The same hardenability constituent as working example 6-15 can be prepared using the polyoxallylene series polymer (A-3) which has the trimethoxysilyl group obtained in the synthetic example 3. The tack free time of this constituent has short cure time, and good physical properties are acquired.

(Constituent which used the epoxy resin together)

The same hardenability constituent as working example 6-15 can be prepared using the constituent which used together reactive silicon group containing organic polymer and an epoxy resin. When this constituent is used, the manifestation of adhesive strength is quick.

[0193]

[Effect of the Invention]

(A) The organic polymer which has the hydroxyl group or hydrolytic basis combined with the silicon atom, and has at least one silicon content group which can construct a bridge by forming a siloxane bond, (B) Carboxylic acid calcium, carboxylic acid sodium, carboxylic acid potassium, carboxylic acid titanium, carboxylic acid aluminum, carboxylic acid barium. The hardenability constituent containing one or more carboxylic acid salts and metal salt which it comes to choose out of carboxylic acid magnesium, carboxylic acid nickel, carboxylic acid cobalt, and a carboxylic acid zirconium. While making practical hardenability and stability, the hardened material obtained shows the outstanding mechanical physical property which has high intensity and high elongation as compared with the case where the carboxylic acid tin currently used conventionally is used as a curing catalyst. Therefore, the hardenability constituent of this invention is very useful as various elastomers, such as a sealing material, adhesives, a binder.

[Translation done.]